

one brood of the former. Even so if any number were taken it would be easy enough to separate them; but if a single aberrant *malvoides* with abnormal development of the basal spots, was taken with some number of *fritillum*, it might be difficult to identify superficially. In such a case one would have to depend on one or more of the following characters of *malvoides*, none of which are really constant, but one or two are always present, so far as my experience goes. (1) Small size and less prominent development of white upperside; (2) the nervures and ground colour of hindwing underside of different shades; (3) general irregularity of all white markings of hindwing; and (4) browner ground colour. In Switzerland, however, *fritillum* does not occur in the area inhabited by *malvoides*.

As in *malrae*, the var. *reducta* is frequently found, but an increase in size of the basal spots never coincides with a reduction of the spots of the median band, and therefore the various aberrations of the *reducta* form never confuse the identity of the species.

This completes the list of the Swiss species, but some mention must be made of *H. centaureae*, for Mr. Wheeler included it in his Butts. of Switzerland on the strength of a record of Rätzer's, recording the capture of it in the Steinen Tal (Simplon Pass) in June and July. That this record was the result of an error in identification there can be no doubt. Prof. Reverdin tells me he believes it to be so, and that he has never seen a Swiss specimen of *centaureae*. I may also add, that I have never met anyone who has, or heard of, any capture. What species Rätzer took in the Steinen Tal, one cannot say, but I strongly suspect it must have been the ubiquitous *andromedae*; the only alternative being *cacaliae*; for the date, June, at that height excludes the possibility of *alveus*, and it seems impossible that he could have mistaken *serratulae* for *centaureae*.

I cannot end these notes without acknowledging the kindness and promptitude with which Professor Reverdin has always been ready to give me the benefit of his great experience in detail, whenever during the past few years I have asked for his opinion on any obscure point.

The accompanying plate illustrates some of the very variable *extensa* and *reducta* formations, of a few species of each group, with one or two typical specimens for comparison. The figures are exactly natural size, so may be useful as an indication of the features which may be developed in species of either group by this convergent line of variation.

EXPLANATION OF PLATE III.

A.

1. *H. alveus*, type. 2-6. *H. alveus*, *extensa* formations. 7. *H. serratulae*, type. 8-9. *H. serratulae*, *extensa* formations. 10. *H. carlinae*, type (larger than normal). 11-12. *H. carlinae*, *extensa* formations.

B.

1. *H. andromedae*, type. 2-4. *H. andromedae*, *reducta* formations. 5. *H. cacaliae*, type. 6-8. *H. cacaliae*, *reducta* formations. 9. *H. onopordi*, *reducta* form.

Further Notes from Palestine.

By H. W. ANDREWS, F.E.S.

The following notes are in continuation of those that appeared in a former number of this magazine and deal with further entomological

observations up to the close of the campaign in Palestine and Syria. In addition, I have incorporated a good many general remarks which I trust will prove of sufficient interest to warrant their intrusion in a scientific periodical. The opening paragraph of the former notes pointing out their necessarily indeterminate character may be taken to apply equally to these, as although I had some apparatus sent out from England it arrived too late in the season of 1918 to be of much use and during the active military operations in the latter part of the year had to be "dumped" with all other baggage. I have had the advantage, however, of access to the collections in the Entomological Section of the Ministry of Agriculture in Cairo, and have to thank Mr. G. Storey and Mr. E. W. Adair of that Department for their kindness and courtesy to a mere "other rank" in helping him to identify several of the more common insects referred to in the course of this article.

During the summer of 1917 my unit remained in Lower Palestine facing the Turkish lines below Gaza with but little doing beyond the daily shelling and occasional raids on our part. Everything was very dried up, and except for grass-hoppers, ants and house-flies, insect life was scarce. In August the camp was moved down to some fig-groves on the coast, the fig-trees growing out of the bare sand. Here I noticed a few Pierids and a fair-sized sand-wasp with a grey black-marked abdomen and lemon-coloured legs and mandibles, a silvery sand-frequenting species of ant, and among the Diptera a small Trypetid (? a *Carphotricha*) which was abundant, a *Chrysophilus* (?) and an Asilid (*Philonicus*?). On our return to the downs inland I was laid up with a bout of fever and sent down the line to Cairo. Here in a small garden attached to the barracks at Abbassia I noted in Diptera a species of *Siccus*, *Catacomba pyrastris*, a *Syrphus* and an *Eristalis*; a small skipper butterfly was not uncommon, and the common Eastern hornet (*Vespa orientalis*) was abundant round about the refuse tubs. I rejoined my battery in October and remained until the end of the month when I had ten days leave which I spent in a hasty visit to Luxor. I spent all my available time visiting the marvellous ruins, but noticed one or two specimens of *Danaida chrysippus*, a very handsome dragon-fly with a deep red body and wings, a number of webs of some gregarious caterpillar on the mimosa trees, and also a large number of spiders' webs on some telegraph wires! On my return from leave I was detailed to take over the charge of a baggage dump at Belah, some eight miles south of Gaza, where I spent a somewhat monotonous time until the beginning of February. There was not much vegetation and insects were scarce. At times it was even difficult to find house-flies in sufficient numbers to feed the chameleons which were kept as pets in many of the tents. Towards the end of January scarlet anemones and a pretty little iris appeared in flower, and I noticed some humble-bees, a small Syrphid fly and odd specimens of *Pyrameis cardui*.

At the beginning of February I left Beleh and rejoined my battery at Mulebbis, a good-sized village situated some six miles inland and the same distance north-east of Jaffa, and I remained there until mid-July. Mulebbis is one of the oldest Jewish colonies in Palestine, having been founded in 1878, and is surrounded with extensive orange groves and orchards, interspaced with well grown belts of eucalyptus planted for

drainage and (?) febrifugal purposes. Between Mulebbis and Jaffa lies the coastal plain of Sharon watered by the River Auja, and a few miles to the east is the commencement of the range of limestone hills that form the backbone of Palestine. The soil was dry and sandy but appeared to be very fruitful where cultivated. The numerous orange and lemon groves were separated by lanes over-shadowed by tall hedges of mimosa on either side, with an occasional stretch of cactus; and these lanes, with the red-tiled roofs of the majority of the houses as well as the European dress of the colonists, formed a great contrast to the flat-roofed, mud-built villages and the universal eastern costume met with in the districts below Gaza, and gave quite an English aspect to the landscape, reminding me more especially of some of the fruit-growing districts of Kent. Oranges and lemons were very plentiful as might be expected, and although sundry regulations were issued prohibiting the troops from picking them, these were more honoured in the breach than the observance, at any rate by troops quartered in the groves. Units less happily situated had as a rule an orange ration issued to them, but our own men had as many as they liked to eat for the picking—with the full acquiescence of the owners be it said.

Each grove had its own well for irrigation purposes; not such wells as we have in England, but consisting of a masonry shaft some 50 feet deep and 18 feet or so in diameter, the piping for the water being carried down the centre into the ground and braced by iron girders at intervals. When in use the water was pumped up by stationary steam or gazogene engines into fair-sized reservoirs of stone or cement (which formed admirable open-air swimming baths), and let out thence into the stone or gutter-piping drains which intersected the groves in all directions. There was almost always a shallow pool of water at the bottom of the well-shafts varying in depth from a few inches to a couple of feet, and these pools, the reservoirs, and the numerous little subsidiary basins in the gutters, formed favourable breeding grounds for mosquitoes; moreover the locality was known to be malarious. The R.A.M.C., however, proved equal to the task of tackling this danger. The whole area was marked out into districts; all wells, pools, etc., marked; samples of the water taken and inspected for the purpose of detecting the presence of mosquito eggs or larvæ; and in every case where the presence of mosquitoes was proved, the water was treated to a mixture of crude oil and paraffin well stirred in, and this treatment was renewed where necessary at periodical intervals. In Mulebbis *Culex* larvæ were found more commonly than those of *Anopheles*; but at Medjal-Yaba, in the foothills some miles further inland, where the water-supply was derived from cave wells, *Anopheles* was the prevalent genus. Another anti-malarial measure was taken by cutting down the vegetation near the bridges and bathing places on the River Auja and the ways leading down to it. This necessarily entailed a good deal of labour, but when there is an Army available such work can be carried out to an extent impracticable to local effort and hired labour. Mosquito nets were issued to the troops, and carefully drawn up instructions sent to all units. One unavoidable evil lay in the fact that practically the whole resident population was infected with malaria, but as a result of the above mentioned precautions there was nothing like an epidemic among the troops quartered in the

district, although a certain number of cases occurred. Incidentally it may be remarked that the Turkish armies were reported to have suffered far more severely from this insect-borne disease than the British and Indian forces opposed to them. I did not myself see an *Anopheles* mosquito during my stay at Mulebbis, although *Culex* was not uncommon.

From March to the end of May there was a great wealth of wild flowers in the groves. These gradually withered away in June and July until in the latter month the plains became a waste of dried up thistles and *Umbelliferae*. I noticed that these latter flowers when fresh did not attract insects to anything like the extent they do in England, and another feature that struck me as curious was the fact that the wild flowers around and under the trees might be alive with beetles, flies, and occasional butterflies, but they one and all neglected the orange blossom, and I did not understand how fertilisation was carried out. I asked one of the proprietors and he told me that bees were the agents, but they were very seldom seen at the blossoms, and I only remember noticing one row of hives. It may be that nocturnal Lepidoptera have something to do with the fertilization, but I have no notes of seeing any moths at the flowers and any systematic night work was out of the question.

All the undergrowth of flowers and weeds in the groves was cut down and the ground dug over during the month of April prior to irrigation. While they lasted these flowers attracted many insects but not a very large number of species. My observations were confined to the orange groves and lanes near by, and I had no opportunity except on one occasion of going out on the plains or to the hills. In this cultivated area butterflies were but poorly represented and I saw nothing in the nature of the large flights referred to in my previous article as occurring in the spring of 1917 near Belah. It is possible that the latter district lies in a migration track or there may have been some exceptional weather conditions. *Colias edusa* and one or two species of Pierids (*Euchloë belemia* and *Pieris brassicae*) were generally common. A small blue (*Zizeeria karsandra*) was also very common; a larger blue was once or twice seen, but not closely enough to identify it with any certainty. *Rumiccia phlaeas* was not at all uncommon and a small skipper (*Carcharodus althaeae*) fairly frequent. I saw one brimstone and every now and again caught a glimpse of a swallow-tail. The only occasion on which I saw a variety of butterflies on one day was on May 16th, when I had a holiday and followed the course of a wady, down to the River Auja. Here, especially towards the river end where the vegetation was almost tropical in its density, I saw more insects at once than at any other time during my stay in Palestine including most of the butterflies mentioned above and in addition several Satyrids closely resembling Meadow-browns, and two or three *Danaida chrysippus*.

With regard to moths, *Macroglossa stellatarum* was common at Mulebbis, and three or four specimens of the fine Atlas moth *Saturnia pyri* were brought to me for identification. Geometers of several species came to light or were disturbed from the undergrowth during the daytime; amongst others a small emerald (*Nemoria faustinata*) on the 16th April and on several subsequent occasions, also a *Eubolia* (?) resembling *E. plumbaria* and two or three species of *Eupithecia*. The

only Noctuid that I recognised was the well known *Plusia gamma*. During May a handsome Burnet moth (*Syntomis mestratii*) was often seen. My observations of moths were very scanty as it was distinctly unadvisable to go about with lights at night and anything like sugaring was out of the question. On the whole lepidopterous life was disappointing.

Dragonflies were not common at Mulebbis, but by the River Auja on the 16th May they were present in considerable numbers and variety, one species with mauve wings and body being specially noticeable for its translucent beauty in the sunshine. Several species of small ant-lions occurred, first noticed on the 8th May and subsequently quite common, and a much larger species with variegated wings was not uncommon later in the season. In April I noticed a small Trichopteron in some numbers round one of the basins in the irrigation channel of an orange grove. A lacewing fly (*Chrysopa vulgaris*) (?) was brought to me for identification once or twice.

I did not observe many Coleoptera, but I know nothing of this order and probably passed over many species. Those noted are as follows: a densely pubescent species (? *Tropinota squalida*), probably identical with that noted in my previous article as occurring at Kantara in March, 1917, was extremely common on flower heads in the latter half of February and during March. Its place was taken later by another day-flying species, bright red in colour and about the size of a honey bee which was as common on the flowers as the familiar soldier beetles *Telephoridae* are on *Umbelliferae* at home. A *Scarabeus* with a rhinoceros-like horn, *Phyllognathus silenus*, was brought to me on the 15th March, attracted by light, and from time to time other species of this genus turned up. Large dung-rolling beetles (*Pimelia*) were also seen. On the 16th May I noticed tiger beetles at the River Auja. Fireflies were not at all uncommon and first noted at the end of April, and water beetles occurred in some of the tanks in the groves.

Crickets (*Liogryllus bimaculatus*) were almost as common as in Egypt; mole-crickets were not uncommonly found in the irrigation tanks, which seemed to have a fatal fascination for them; a large variety of grasshoppers and some locusts seen, but no swarms of the latter occurred. The large size and clumsy flight, of a large species of locust (*Pachytylus danicus*) when disturbed caused me more than once to mistake it for a startled bird. Two or three kinds of *Mantidae* occurred.

Hymenoptera were abundant both in numbers and species. Ants of three or four species were very common and some of their "runs" plainly visible in the short grass and extended some twenty yards or more. A shining black species (? *Pheidole megacephala*) about half as large again as our common garden ant in England, was noticed swarming in small columns about four feet high just over its nests. These swarms were first noticed on the 21st May and at a little distance looked like so many columns of smoke from small fires. They were only in flight from about 7 to 10 in the mornings, and continued for a fortnight or three weeks. Among other Aculeates, solitary bees of numerous species were abundant; the dry sandy soil seemed well suited for them and they flourished accordingly. On the 18th February a species of mason-bee was very busy exploring the walls of the shed in

which we were quartered and the large clumsily built ant *Doryllus juvenens* ♀ came to light every now and again.

Respecting the social Hymenoptera several large bumble-bees were seen at the River Auja on the 16th May. I have remarked above on Honey bees; their place and that of wasps was taken by the common hornet of Egypt and Palestine (*Vespa orientalis*). A large kind, possibly queens, were quite common from the middle of March to mid June, when they gave place to smaller ones (? workers). I once came across a ground-nest in the open plain (as a rule they do not nest in the open ground but on roofs of sheds, etc.) it had rather a wide exit of some two inches in diameter. The hornets did not seem at all vicious and only two cases of stinging came under my notice; one of a man who unfortunately for himself disturbed a nest while bathing and got badly stung; the other occurring on the trek up from Haifa to Beirut when one of the horses of the Battery Staff must have trodden on a nest. There was a considerable disturbance and a relaxation of march discipline for the time being on the part of the staff, and the guns and wagons following made a discreet detour, but the only sufferers were one or two of the staff horses. I did not see the common wasp (*Vespa vulgaris*) until we were at Beirut in November, 1918, when it took the place of the hornet, but probably owing to the lateness of the season was not common. A handsome thin-waisted wasp (*Sceliphron spinifex*) first noticed on the 16th April, was subsequently very common in the dug-out telephone pit in the gun line at Mulebbis taking little or no notice of the operators and indefatigable in building its little clusters of mud cells and storing them with small spiders. Sundry sawflies were noticed.

Diptera were numerous but unevenly distributed as regards families. This order being my speciality I naturally devoted extra attention to it. I have already mentioned the anti-mosquito campaign in the earlier portion of the article; *Culex* was quite common and *Anopheles* also occurred, although I did not myself come across any whilst in Palestine. A smallish *Nemocera* (a Chironomid?) was also very common coming to light at dusk. I frequently had specimens brought to me as possible malarial mosquitoes. I have no notes of any *Tipulidae*, but a minute midge, I do not know of what genus, was a great torment. These midges first appeared about the middle of June and lasted for a fortnight or more, they had an irritating bite but contrary to our English midges they were most troublesome in the daytime and in sunshine and disappeared at dusk. A species of *Bibio* (? *marci*) was common for a few weeks from February 12th onwards.

Dolichopodidae were not at all common, a species of *Psilopus* was seen on the eucalyptus leaves at Mulebbis, and another species (genus uncertain) in some numbers on the 14th May at the muddy margin of some small pools in the vicinity. These were all I noted.

Empis tessellata first occurred on the 16th March and was very common whilst it lasted, a Tachydromid was common in the orange groves towards the end of March and a few small Empids occurred in April, but this family as well as the *Dolichopodidae* seem to be poorly represented.

The families mentioned in vol. v. of Verrall's work on flies (*Stratiomyidae*, etc.) were the best represented of any. A small *Bombylius*, first noted on 27th March (*B. flavipes*, Wied.), was very

common on flowers and the dry sandy borders of paths in the orange groves; and much less commonly a larger species of *Bombylius* (? *exoprosopa*) with darkened wings and black tipped copper coloured abdomen. A small Stratiomyid was to be found on the banks of the lanes from April 3rd. I noticed the first Tabanid on the 15th April and from thence onward they were common and a source of annoyance to the horses: a black-winged, black-bodied species; a small species resembling our *Tabanus bromius*; and an *Atylotus* (non-British) were the most common. I did not see any *T. bovinus* or *T. autumnalis*. A species of *Haematobia* also occurred. The first Asilid (? *Dysimachus*) was noted on the 27th of March and another large reddish species resembling *Eutolmus rufibarbis* was extremely common in the fields and on the undergrowth of the orange groves for about three weeks from the 21st April. A species of *Therera* was seen on the 16th of April and again on the 22nd May on the eucalyptus leaves. The genus *Anthrax* was well represented as might be expected from the numbers of their larval hosts the burrowing bees. I have a note on 24th April of the occurrence of six different species, none of which I had noticed previously; at least two of these were more or less common for some weeks.

In the *Syrphidae*, *Eristalidae* were common, and I more than once noticed their "rat-tailed maggots" in dirty tanks near the wells. *Eristalis tenax*, *E. pertinax* and *E. aeneus* were noted on 16th-20th February. A *Chrysogaster* occurred on 16th March as well as one or two species of *Syrphidae* proper. A *Sphaerophoria* and *Syrphus balteatus* were abundant on flowers in the undergrowth of the orange groves from 27th March onwards. A single specimen of a very handsome black and white marked *Volucella* was seen on 26th May. On the whole this large family was not well represented.

Apart from *Musca domestica*, *Stomoxys calcitrans* and one or two species of bluebottle, *Muscidae* were absent, but the first named species easily predominated over all other kinds of insects in numbers and persistence as it occurred all the year round. *Tachinidae* did not seem common except for *Sarcophagi*, some species of that genus being very frequent round about the kitchens and latrines. A few flower frequenting Tachinids were seen. *Anthomyiidae* were also very scarce in species and individuals compared to an English standard. *Anthomyia pluvialis* occurred and was first noticed on 18th February; a species of *Hylemia*? on 20th March; *Melanochiria riparia* was not uncommon round some of the irrigation tanks, it was noted first on 29th March. A species of *Hyetodesia* was abundant near the latrines from 12th April onwards; on the 29th of that month I noticed a small Anthomyiid fly in some numbers on the trunks of eucalyptus trees and a deep blue species (*Ophyra*?) was in great abundance on the leaves of a mulberry tree on 15th June. The above mentioned species were the only Anthomyiids noticed. In the Acalypterate group of Diptera I have only records of a *Sepsis*, very common around the latrines in the orange groves from February onwards, and two species of *Tetanocera* which used to occur on eucalyptus leaves. I do not recollect ever noticing a *Scatophaga*. A species of *Hippobosca* was common among the horses and first observed on the 15th April.

I noticed that tree trunks which in England afford favourite resting places for many species of Diptera did not seem in the least

attractive in Palestine. The only case that came under my notice was that of the small Anthomyiid mentioned above; it must be borne in mind, however, that trees of any kind except eucalyptus, a recent importation, were very scarce, and another factor of some importance was the presence of numerous lizards. The eucalyptus is generally supposed to act as a deterrent to mosquitoes, but this was not the case with *Culex* at any rate, nor did it affect the biting midges I have mentioned. I had good opportunities to test this theory, as from the middle of May to the end of June my quarters by day and night were situated in a belt of eucalyptus between the orange groves and the open plain. As the road on the belt towards the plain was in view as well within gun range of the Turks, it was desirable to keep well inside the eucalyptus belt, and a considerable number of the Diptera recorded above occurred on the leaves of these trees. On the 15th June I noticed what I took to be a case of honeydew attraction. There was a large mulberry-tree in one of the groves adjacent to an irrigation tank, and on that date the leaves—the fruit was barely ripe—were crowded with Diptera, mainly *Musca domestica* and a deep blue Anthomyiid fly, and hornets. I only noticed this once. The irrigation tank just mentioned seemed to have a great attraction for mole-crickets (*Gryllotalpa vulgaris*). We used to go to it between 5 and 6 a.m. for a bathe, and there were usually half a dozen or so swimming round and round the smooth concrete margins which gave them no foothold to get out. I do not know whether they were attracted by the moisture or if they were allured by the moonlight shining on the water. I was carrying one in a handkerchief one morning and was surprised at the strength it exerted in trying to get out. I had to keep my fingers tightly closed over the handkerchief to prevent it forcing its way between them.

On the 1st July the Battery left the Mulebbis gun lines and moved to a training centre on the plain. The ground was parched and few insects except grasshoppers were to be seen. In one spot I observed some rather large sandwasps (*Ammophila*). We stayed here for three weeks and then were ordered to proceed to the Jordan Valley to relieve some R.H.A. units. After two days' trek we got to the hills and began the ascent to Jerusalem. On the western side these hills have a fair amount of vegetation and olive trees are numerous. As soon as we got into the hills butterflies appeared with more frequency and I saw *Teracolus* for the first time. Whites also were fairly common. Four days after leaving the plains we reached the top of the crest and passed through the suburbs of Jerusalem, catching tantalising glimpses of the Holy City en route. The next two nights—as day travelling was now inadvisable owing to enemy aeroplanes—we spent going down to Jericho. The eastern slope of the hills was a great contrast to the ascent from the west. The gradient was extremely steep (within 20 miles the ground falls from 3000 feet above to 1300 feet below sea level) and although we went by the newly made motor road, hairpin curves were frequent and there was only a fragile stone parapet of about 3 feet in height between the roadside and the deep rock-stewn ravines. Instead of the semi-cultivated ground with occasional hamlets there was nothing but arid sun-scorched rocks with one or two ruined buildings at long intervals, and the chalky dust that we stirred up in our passage reminded me of the windward side of a cement factory on the lower Thames. We got to Jericho on the 26th-27th July. The

plain of Jericho and the Jordan valley generally in the summer months takes a good deal of beating for unpleasantness, and anyone who has experienced its oppressive, dust-laden atmosphere will not be inclined to condemn anyone to "go to Jericho" without grave provocation. As stated it lies some 1000 feet below sea level, sinking to 1300 feet below at the Dead Sea, and is inches deep in loose dust which rises in clouds at the passage of animals or motor lorries. The heat was most oppressive both by day and night. A fringe of dust-covered bushes that bordered a little perennial stream running down from the Judæan Hills and a number of dead-looking thorn bushes were the sole specimens of vegetation, except in the gardens of Jericho itself, which consisted for the most part of squalid mud-built houses with a few modern stone edifices and a solitary mosque with a tall minaret. The district has a bad name for malaria and house-flies abounded. There was a story current that the Turks had sent a message in June to the effect "this month flies die, next month men die, we will come and bury you in the autumn." Like other Turkish prophecies it proved false in all particulars.

We lay one night at Jericho and the next night started on the final stage of our destination. As seen from Jericho the plain appears to be practically level to the opposing wall of the hills of Moab, but after proceeding for a couple of miles or so along a gentle decline the road suddenly dips without any preliminary warning into a chaotic series of gullies and valleys carved out of the white crumbling limestone below the general level of the plain. We wound our way through these for another mile and finally reached the narrow belt of vegetation that borders the river Jordan on both sides. There were numerous trees on the river banks (willows, acacias, tamarisks, oleander and poplars are mentioned in a Guide book) and plants that on the plains only grow to a couple of feet or so were present here as quite large shrubs. There was an undergrowth of coarse grass and reeds and we lived in reed-wattled shelters. It was very hot and dusty despite the vegetation and we all suffered more or less from prickly heat at night. The Jordan here was a mud-coloured turgid stream some 50 or 60 yards in breadth flowing with a very strong current between high banks. When bathing, even at daybreak, its temperature was tepid and not at all refreshing. As to insect life, butterflies represented by *Teracolus fausta*, whites, a small blue, and the small copper were very common and there were usually one or two *D. chrysippus* sailing leisurely about on the river banks at the bathing place. Dragon-flies were also a good deal in evidence. I did not notice many flies or mosquitoes but a small midge, nocturnal this time, added to the worries of the hot nights. I several times saw a very large *Anthrax* almost the size of a humble-bee. After a few days stay in this jungle the guns were moved out, to our great relief, and sent back into one of the valleys of the maze of broken hills, through which we passed on our way. Life was more endurable here though the heat was still great. Where the gullies opened out there was usually a scanty undergrowth of stunted brushwood, and the floors of these valleys in the early morning would be damp and sticky with the moisture that oozed out of the surrounding hills. The damp line could be traced on the chalky slopes as plainly as on the walls of a newly built house. As soon as the sun gained strength all was dried up into crumbling dust. A little stream ran

through our particular gulley with a fringe of bushes, and the trough of the valley acted as a sort of funnel for the wind which used to spring up every afternoon usually bringing a dust storm with it. The summits of these hills were weather-worn into all sorts of fantastic shapes and I longed for an artist's gifts to sketch some of the curious outlines. The ground was pitted with the little burrows of ant lion larvæ but there were not many insects. Some of the bushes by the stream were in flower, a lavender coloured blossom of a *Spiræa* type, and what insects there were came to these. A skipper butterfly used to frequent them and an occasional *P. cardui* would put in an appearance but the most constant visitors were large humble-bees with black wings and bodies and a conspicuous yellow thorax; *Xylocopa aestrans* and one or two solitary bees and wasps also occurred. Mosquito nets were "de rigueur," but I did not see any mosquitoes, though we had several cases of malaria or what was diagnosed as such by the M.O. during our stay.

The Battery remained in the Jordan Valley for some six weeks and then we were relieved in our turn and went back to the coastal sector in time to take part in General Allenby's great advance in September. We subsequently followed up the victorious cavalry, trekking across the plain of Esdraelon, which consisted mainly of a sea of very prickly thistles, distinctly unpleasant as bivouac sites, and reached Haifa on the 1st October. Here we made another three weeks stay and a few Lepidoptera were observed, *Macroglossa stellatarum*, an "oak eggar" moth, and "vapourer" moths both in the larval and imaginal states. Silver-fish insects were noted in the building in which the Battery office was situated. The swampy nature of the hinterland of Haifa was probably responsible for a good many cases of malaria that occurred during our stay.

On the 22nd October we received orders to move up to Beirut, and a nine days march along the coast passing Acre of crusading and Napoleonic fame, and Tyre and Saida (Sidon) taking the memory back to the earlier days of the Phœnicians and Biblical history. The gradual change in the character of the vegetation, the buildings and the dress of the inhabitants as we proceeded on our route was very interesting. Between Tyre and Sidon we passed by a deserted cliff-village with a number of caves and rock dwellings, reached by roughly hewn flights of steps cut out of the rock. A fact that specially struck me was the startling contrast between the barren, rocky slopes of the hills on one side of the road and the luxuriant growth of vegetation and fruit trees in the cultivated areas on the seaward side; these areas only occurred in the vicinity of the towns and I suppose were the result of generations of culture, as nothing looked more unpromising than the slopes of these hills. The only insects noted were *Colias edusa* and *Pyrameis cardui*. These two species seem to be the commonest kinds occurring in Palestine, they were noticed everywhere and seen more or less all the year round. We arrived at Beirut on the 31st October and took part in the formal march of the 54th Division through that town at the hour at which the Armistice with Turkey was signed.

Almost as soon as we had reached Beirut the rainy season set in, and this coinciding with an outburst of "Spanish flu" had disastrous consequences on the health of the troops, who were tired out with the strenuous work of the pursuit of the remnants of the Turkish Armies.

I saw only a few insects. A fine specimen of a *Doritis apollinus* was brought to me on the 9th December,* and the usual *edusa* and *cardui* occurred. I noticed some common wasps (*V. vulgaris*?). In the Diptera a Stegomyiid mosquito and a red-bodied Tachinid were both common, the latter to be found running about on the stone walls of the houses. The Battery left Beirut by sea for Egypt on the 11th December, and my last impression of Syria was the wonderful rose-coloured sunset glow on the snow summits of the Lebanon range overlooking Beirut, for although the vegetation round the town itself was of a semi-tropical nature the hilltops had been covered with snow for some days.

On arrival in Egypt we were stationed in a large camp just outside Heliopolis, one of the suburbs of Cairo, and on the opposite side of the City to Mena where we had quartered on our first arrival in Egypt nearly three years earlier. Here I noticed a true malarial mosquito, *Anopheles pharoensis*, rather to my surprise, as the camp, a newly formed one on the desert, was at least a mile from the nearest standing water. During our stay here I had the opportunity of visiting the interesting collections in the Entomological section of the Ministry of Agriculture at Cairo, though I could not spend as much time there as I should have liked. In the middle of March I got my demobilisation papers and was fortunate in getting away just before the first of the native risings. I had an uncomfortable but uneventful three weeks going home *via* Taranto and Le Havre, and arrived in England again after three and a half years' service abroad just in time to spend Easter at home.

Allowing for the limited opportunities I had for entomological observations I should think a collecting trip to Palestine would prove interesting, but more so to Hymenopterists and Dipterists than to students of other orders. The Jordan Valley in the spring would I believe well repay a collector, and the plains and more fertile portions of Palestine would likewise be attractive, but one would have to go in the earlier months of the year, and I certainly endorse Major Graves' general remarks in his article on page 64 of the *Entomologist's Record* for 1919 as to taking precautions against malaria and snakebite.

Seasonal Polymorphism and Races of some European Grypocera and Rhopalocera.—Additional Notes.

By ROGER VERITY, M.D.

(Continued from page 8.)

Agriades coridon, Poda, form *SAMSONI*, mihi, and *A. thetis*, Rott., ab. *PETRI*, mihi, and *polonus*, Z.—Some years ago Ing. Samson of Lyons sent me two male *Agriades*, which he had collected on June 16th, 1907, at the "foot of the Grand Salève," near Geneva. As nothing has been published about them, to my knowledge, and as I cannot come in touch again with Samson since the war, I think it advisable to make this extremely interesting form known from the specimen which has remained in my possession. At first sight the upperside colouring, of a brilliant electric blue, similar to the brightest and less violet specimens of the southern races of *thetis*, and the early

* The specimen referred to was in perfect condition. Mr. A. H. Jones, who kindly identified it for me, stated that the date was of interest as according to Seitz the species emerges in February and March.